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A STATISTICAL STUDY. BY
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DOUGHT TUBERCULAR DISEASES TO BE TREATED IN THE SURGICAL WARDS OF A CITY GENERAL HOSPITAL? A STATISTICAL STUDY.

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It is hardly possible for any, except those in professional and personal charge of a surgical ward in one of our large general hospitals, to properly appreciate and weigh with serviceable intent the many bearings which tubercular diseases possess, when considered in relation to the work as a whole, carried out on the surgical side of the institution. The annual reports of our infirmaries are not sufficiently exact, nor so uniform in their classification of the diseases treated, as to render it possible to make use of them for any strictly professional purposes. Even supposing an attempt were made to classify under one head all diseases described as tubercular, it is doubtful whether these reports would then be sufficiently reliable for technical statistical purposes. Unless special note were taken, and every endeavour made to ascertain whether each case admitted into hospital was or was not one which should be considered tubercular, the number of cases certified as such would probably be considerably under the actual number treated.

So far as our Glasgow Infirmaries are concerned, the annual reports attempt no such classification, and we, therefore, find that tubercular diseases are distributed under many different heads, and not only so, but in several classes where certain diseases may or may not be tubercular—as, for instance, mastoid disease—there is no means of knowing to what cause the affection should be attributed.

For these various reasons, therefore, the relation which cases of tubercular disease bear to other classes of disease treated in a surgical ward can only be ascertained with any approach to accuracy, and utilised for any practical and serviceable purposes, through the personal observation and record of the surgeon in charge. With him alone rests frequently the decision as to whether the disease in any particular instance owes its origin to tubercular infection or not. Unless, therefore, this differentiation be made in every case, it becomes impossible by any other means to ascertain accurately the relative numerical proportion of cases of tubercular disease admitted or to arrive at any other conclusion where comparisons are needed.

With the object of obtaining some sort of an estimate regarding the number, nature, and gravity of the cases of tuberculosis admitted into my wards at the Victoria Infirmary, I have since the opening of the institution kept an accurate record of every case. The age and sex of the patient have been noted, the number of days of residence in the ward, the region affected, the treatment adopted, the result, and such other incidental facts that seemed of technical interest. I had not contemplated making an immediate use of these records, but, as the editors of the *Glasgow Hospital Reports* have again kindly asked me to contribute, it occurred to me that such general information as it seemed possible to derive from a consideration of these personal records might prove of a kind peculiarly suited for such a periodical as our "Annual Reports."

Although the Victoria Infirmary has been opened for about twelve years, I have made use only of the last five for the statistics given below. It is within this latter period that my two male and female wards have been in full working order.

I may indicate, in the first place, that I only intend drawing upon my records for such information as will serve the particular purposes I have in view. There are naturally many other facts capable of deduction from the same sources. These, however, will be kept for possible future use. What I want to consider and discuss in the present paper may be thus briefly indicated:

- (1) The proportion which cases of tubercular disease bear to other diseases treated in a general surgical ward.

- (2) A limited classification of diseases dependent upon tubercular infection, with special reference to the parts or regions most frequently affected.
- (3) The period of residence in hospital of cases of spinal disease and hip joint disease treated more or less to a conclusion.
- (4) The ages at which tubercular diseases are most frequently met with.

And then in conclusion I shall make such comments and proposals as I think a consideration of the above points reasonably warrants.

I may state that the accommodation afforded for the cases to be considered comprises two large wards—a male and a female—each having eighteen beds and three cots; two special rooms, one containing three and the other four beds; making a total of forty-nine beds.

Discussing the points in order, as above indicated, the following table (A) shows the relative proportion of tubercular and non-tubercular cases admitted within the five years:

TABLE A.¹

Percentage of Cases of Tuberculosis admitted within the five years, 1896-1900.

Date.	Tubercular.	Non-Tubercular.	Total Admission of all Cases.	Percentage of Tubercular.
1896	107	290	397	26·9
1897	108	323	431	25·0
1898	115	324	439	26·1
1899	108	359	467	21·2
1900	114	364	478	23·8
Totals	552	1660	2212	—
Average Admissions per year	110·4	332	442·4	24·9

¹It should be stated in connection with the table that the numbers in columns 2, 3, and 4 have reference to “admissions” and not to the actual number of separate individual cases; that is to say, among both classes, whether

Taken over the whole period of five years, it will be seen that the proportion of tubercular to non-tubercular cases admitted is practically one-fourth.

The next table (B) is intended to give some idea of the nature of the cases and the numbers of such cases admitted.

TABLE B.

Shows relative frequency with which certain regions of the body are infected with Tuberculosis, and the number admitted each year from 1896-1900.

Date.	Spine.	Hip Joint.	Knee.	Ankle.	Shoul- der.	Elbow.	Wrist.	Cervi- cal Glands.	Others.	TOTAL.
1896	14	8	6	4	1	6	1	22	45	107
1897	8	18	6	5	1	6	—	32	32	108
1898	10	12	8	7	2	4	1	22	49	115
1899	10	13	10	4	2	7	1	21	40	108
1900	11	17	4	1	3	5	1	15	57	114
Totals	53	68	34	22	9	28	4	112	223	552

A glance at the above table shows that so far as the classification has been carried out, cases of infected cervical glands are among the commonest; and that among joint cases, those of the hip and spine take a somewhat long lead of the others. The knee and the elbow stand about equal in frequency: followed, however, somewhat closely by the ankle. The wrist and the shoulder joints stand very markedly the lowest. Diseases of the hip joint are, I believe, by common consent, allowed to be those most frequently met with. In four out of the five years in the above table, the admissions for this disease were in excess of any other, and only in 1896 were they surpassed by diseases of the spine. Taking the two diseases together, spine and hip, they far and away numerically

tubercular or non-tubercular, no account has been taken of re-admissions, in the sense that the same cases admitted a second or third time are reckoned as two or three cases. It was considered too difficult to take this item into consideration, and while it naturally reduces the actual number of individual cases of disease, the fact that both classes are treated in the same way renders the percentage comparisons practically correct.

exceed the sum total of all the other joint cases. In an interesting and instructive paper¹ read before the Glasgow Medico-Chirurgical Society on December 7th, 1900, Dr. Grant Andrew shows somewhat more accurately than is indicated above the true proportion of hip joint cases "admitted" to individual cases of disease. Thus 92 "admissions" represented 70 separate cases. And again, in calculating the average length of time of residence, Dr. Andrew, by considering the "re-admissions," finds the period to be 150 days, as against my average of 128·5 days shown in Table C. These differences, however, do not constitute inaccuracies, they simply exhibit an aspect of the question viewed from two different stand-points.

TABLE C.

Shows average period of residence in Hospital of Hip and Spine Cases subjected to more or less radical treatment.

Date.	SPINAL CASES.			HIP CASES.		
	No. of Cases.	Case of longest residence in days.	Average No. of days in Infirmary.	No. of Cases.	Case of longest residence in days.	Average No. of days in Infirmary.
1896	6	340	129·1	7	269	147·
1897	3	70	64·6	16	359	166·6
1898	7	169	78·8	8	253	108·2
1899	5	128	88·2	11	312	115·5
1900	7	280	125·9	16	363	101·3
Totals	28	—	101·5	58	—	128·5

The next table (C) is drawn up to show the average length of residence of spinal and hip cases in hospital. The average is calculated only on those cases that have been treated to anything like a conclusion. Many incipient cases of both spine and hip joint disease are taken in only for a few days to have a jacket or a Thomas's splint applied. These, while they

¹ *Tubercular Disease of the Hip Joint: A Critical Examination of 70 Cases treated in Mr. Maynard's Wards of the Victoria Infirmary, Glasgow.* By J. Grant Andrew, M.B., Assistant Surgeon to the Infirmary. Glasgow: Alex. MacDougall, 1900.

are included in the total number of admissions, have not been considered in taking the average, because some of them come in again for more radical treatment, and as such are subjected to efforts directed to effect a complete cure, thus rendering them proper cases to be included in the "average" list.

An examination of the above table shows that so far as the length of residence of any one case of either disease is concerned, there is practically no difference; but considered collectively, hip cases, as a rule, are in the infirmary for a longer period than spinal.

In the next table (D) I have sought to ascertain the ages at which tubercular disease most frequently shows itself; and for this purpose I have made two classifications, one, of patients under and patients over 40 years of age; and the other of quinquennial periods up to 20. The distinction of sex has not been regarded, nor the relative frequency with which certain parts or regions are affected at different periods of life. It may, however, be said that with children at least, sex appears to have little or no influence on one side or the other; and that in the matter of regional disease the joints and bones are the parts most frequently involved in the tuberculosis of early years.

TABLE D.

Shows relative frequency of Tuberculosis at different ages.

Date.	1 to 5 Years.	5 to 10 Years.	10 to 15 Years.	15 to 20 Years.	Total under 20 Years.	Total over 20 Years.	Total of all cases.
1896	24	26	12	17	79	28	107
1897	25	28	22	14	89	19	108
1898	29	27	19	13	88	27	115
1899	23	29	17	11	80	28	108
1900	13	30	19	9	71	43	114
Totals	114	140	89	64	407	145	552

It will be seen from the above table that there is a slighter increase of frequency of the disease between the ages of from 5 to

10 years than between the first and fifth year, but taken together the first decade of life shows a very much greater prevalency than the second decade, or indeed any subsequent period of life. Further, if we consider the total number of cases of the disease which occur in patients under 20 years of age, they are seen to nearly triple the entire collection of cases occurring at any period over that age.

Before passing to the conclusions I wish to draw, and the proposals I wish to make, I should like to offer a few remarks upon the subject of operative treatment. If twenty years of hospital work in the treatment of this disease in the surgical wards of a general hospital may be considered a sufficiently reasonable period to base an opinion upon the relative value of operative intervention, I must own to a resultant feeling of disappointment. Tuberculosis seems to be essentially—at least among the lower classes—a disease which finds its initiation and most fruitful source of development in ill nourished and badly cared-for children. The higher the social scale is mounted the more we find that the “predisposing” element plays the most prominent part. This same element, of course, exercises its influences upon the poorer classes, even to an exaggerated extent; and whatever else may enter into the causation of the disease, or contribute towards its manifestation, it is certain that impoverishment of the system by deficient and bad feeding, with the addition of an insanitary environment, constitute not the least important factors of the many agencies at work. In the few remarks just given expression to are to be found, I believe, the best indications for the most appropriate and successful treatment to be adopted, and also the reason why operations so frequently fail in giving us the good results we otherwise both look for but too often fail to obtain.

A couple of years ago I wrote an article for the *International Clinics*¹ on “Surgery in relation to Tubercular Diseases.” One of the contentions therein expressed was that we should consider tuberculosis in the same light that we regard carcinoma: that just as we deemed it imperative to remove most thoroughly and freely all parts involved in the malignant growth, so we should extirpate as completely all tuberculously infected areas.

¹ Vol. i., 9th series, April 1899, p. 179.

There is no doubt much truth in this, but it is subject to one very cogent qualification, and that is, that while in carcinoma, as far as we yet know, operation is the only means of effecting a cure, it is by no means so in the case of tuberculosis. Indeed herein lies, I believe, a distinction so great that this divergence of likeness renders it all but inappropriate to discuss to any further extent the question of similarity.

The most potent factor in the retardation of the development and progress of tuberculosis is in a very large number of cases to be obtained, not through the intervention of the surgeon's knife, but by the natural resistant powers of the tissues. If these can be raised to the normal standard they will of themselves repel the offensive onslaught of the tubercle bacilli and effect the necessary repair. The enunciation of these facts may appear somewhat trite, but although sufficiently well known they are introduced here more particularly with the object of enforcing and making clearer the conclusions I wish to draw from the tables given above.

I will now consider these conclusions, and, in the first place, briefly state them thus:

1. Tuberculous cases taken as a whole are not suitable for the surgical wards of a general city hospital.
2. All tuberculous cases should be dealt with outside the confines of our large towns, in such places as afford the best opportunities of carrying out the open-air method of treatment.
3. If it is only found possible to carry out the elimination to a partial extent, then hip and spinal cases should be the selected classes for separate treatment of the open-air kind.

In considering the first of these three conclusions, it will not be out of place to give some general idea of the amount of tuberculosis that exists in our city, as judged by the number of cases admitted into the surgical wards *alone* of our three infirmaries—the Royal, Western, and Victoria—and the Sick Children's Hospital. The total number of surgical beds used for general surgical purposes in these four institutions is 622. Referring to Table A it will be seen that out of the average admission per annum of 442·4 cases into my wards, containing 49 beds, there was an average annual admission of 110·4 tuberculous cases. Assuming then, as I think may

reasonably be done, that the admission into the other surgical beds of the above institutions is at the same ratio, we have for the total number of 622 beds an average annual admission of 1401·4 cases of tuberculous disease. This, it may be owned, reveals with approximate accuracy the excessive amount of tuberculous disease that exists in our midst; and yet it is only a fraction of the total number of sufferers, for the present statistics are limited to those cases that find their way into the surgical wards. There are the medical cases in the medical wards; the dispensary cases; those in other institutions like the Broomhill Home and the East Park Cottage Home; and that vast collection which inhabit the slums and densely populated districts of the city. The contemplation of this scourge as thus numerically presented does indeed afford material for the gravest reflection, and shows itself a subject worthy of the most earnest regard and consideration of those whose efforts are being directed rather towards the prevention of the disease than its cure.

It is, however, with the latter of these two considerations that the present remarks have to do; and it is in the admission of the large proportion of cases into the surgical wards that, I venture to think, a mistake is made both in regard to the best means being adopted for the particular class itself, and to the best interests of the many other cases of a different kind which, while quite suitable for admission, are kept waiting indefinitely owing to the overcrowded condition of our wards.

I have already argued that what most of these cases require is not immediate surgical treatment, but plenty of fresh air and good food. I am convinced that there is as much reason for subjecting these cases to the open-air method of treatment as there is for the more specifically considered lung cases. If it is contended that the benefit of this method of treatment in phthisis is due to the direct action of fresh air upon the tubercular lesion in the lung, then except we as completely expose other infected regions a comparison can hardly be drawn. But if, on the other hand, it is in reality the free and perfect oxygenation of the blood indirectly acting upon the infected pulmonary tissue, then this same revivifying influence must be felt by

every other tissue in the body equally and with a similarly beneficial result. Assuming, then, this to be the proper treatment, the surgical wards of our city hospitals are not the best places for receiving this class of cases. And in order that the necessities of the situation may be properly met, it is essential that institutions properly built and suitably equipped should be erected in the freely open and healthy parts of the country.

As regards other classes of cases, which, owing to the great pressure placed upon our wards through the admission of so many tubercular cases, there is, I think, a distinct injustice being done. While practically little or no advance has been made in the surgical treatment of a very large proportion of tubercular cases, immense progress has taken place in other diseases. Thus an enormous field of successful work has been opened up in the domain of abdominal disease, to mention only one department. To keep out cases from being admitted for which immediate and permanent good could be done is, in all truth, submitting our infirmaries to an unintentional and unnecessary abuse. Briefly, then, I consider my first conclusion sufficiently substantiated by these two facts:—First, that tubercular cases could be treated better elsewhere than in our city infirmaries; and, second, that by such elimination or exclusion more suitable and more deserving cases could be admitted.

My second conclusion, that tubercular cases could be better treated in free and open spaces outside our large cities, is to some extent supported by what has already been stated in discussing the first conclusion. But there are other facts besides those above given.

If fresh air is such a prime essential in building up and restoring the natural resistant forces of the tissues, it can only be obtained by locating these cases in areas where the requisite amount of space can be obtained and where there is an absence of those contaminating influences so inseparably connected with all buildings in or in the immediate neighbourhood of large towns. Further, the buildings required are of a totally different kind to those deemed necessary for the treatment of most other classes of cases. Thus they must be constructed on the principle of allowing as much of the open air as possible to find

its way into the sleeping apartments; and, by spreading the buildings outwards rather than upwards, of granting the utmost facility for the conveyance of patients into the open grounds whenever the weather permits.

Table D adds further support to the conclusion contended for. The large majority of cases are under 20 years of age. Out of a total of 552 cases 407 were patients under 20, and of these most were attacked during the first decade of life. Now, it is particularly at this actively growing period of life that the tissues are most susceptible to the beneficial influences of a good environment. A child feeds on fresh air and sunlight almost as greedily as it does on food, and the cheering and stimulating sights and sounds of nature are not without their good effects in restoring the undermined and enfeebled constitution of these usually sickly young patients to a condition of health and happiness. Operation also, when found necessary, will be executed, if not under any better conditions of equipment than at present, at least with every prospect of the patients making a more speedy and satisfactory recovery. The same good influences are at work for the better and more rapid healing of the wounds as for the tissues, which are naturally struggling to check the progress of the disease.

Supposing, then, that only cases under 20 years of age were treated in country institutions, the elimination of this class alone from our city infirmaries would have a very great relieving effect upon our wards, and remove a considerable amount of the injustice which, as already indicated, is involved in the compulsory exclusion of so many cases suited for admission, and better suited for treatment.

But this consideration of the selection of cases leads me to my third conclusion. Whatever divergence of opinion may exist with regard to tubercular cases considered collectively, there is little doubt in the unanimity with which most surgeons are inclined to regard the more limited class of hip and spinal cases. That these may with advantage be treated as a class quite distinct from all other cases of tuberculosis is sufficiently attested by the fact that one special institution, at least, has already been erected for the exclusive treatment of hip disease.

A reference to Table B shows how numerous these cases are, and how they numerically exceed any other individual class. Table C shows the relative period occupied by those cases when treated to a conclusion; or rather it should be said to an attempted conclusion, for even after so prolonged a residence many still leave the hospital with discharging sinuses, or some other conditions which indicate that the disease still lingers. These two considerations alone stamp this particular class of cases as the greatest offenders in the matter of prolonged and exclusive occupation of beds.

But there are additional reasons which make it specially advisable that hip and spinal cases should be treated in an institution of the kind here advocated. Operation is by no means the only and best treatment to be adopted in very many of these cases. Prolonged rest with the application of certain mechanical appliances is frequently the only requisite treatment, and for these patients to lie for months in a ward, requiring no surgical skill and the very simplest of nursing, seems an almost unnecessary waste and even abuse of the skilled resources maintained at such great expense in our general hospitals.

These particular cases are pre-eminently suited for treatment by the open-air method, and ought to be relegated to special institutions not equipped to the high and expensive state of perfection of our city infirmaries, but so organised and arranged that while fitted for such surgical treatment as may from time to time be necessary, they can have all the simple and comparatively inexpensive attention required for an open-air life.

If still another plea were needed in favour of the exclusive treatment of this class of cases it would be that—so far as hip disease more particularly is concerned—it is children that are most frequently the patients. They, as already shown, are of all the most susceptible to the beneficial influences of open-air treatment. Dr. Andrew, in the paper already referred to, has entered a very strong plea for the treatment of hip joint disease in separate institutions. The object of his remarks were almost entirely directed to the attainment of such an end, and the facts which he has been able to obtain

and utilise for the purpose in view will hardly fail to convince those who will take the trouble to consider seriously the subject of the advisability of such a line of action. On this question of age which I have just alluded to, Dr. Andrew states: "Taking all cases, the average age on admission was 11. More than half of the cases, however, were in children under the age of 10; taking these alone the average age was 6."

Many more reasons than those above given might be introduced in furtherance of the objects in view. Enough, however, I trust, has been said in support of the conclusions put forward to render them both acceptable and worthy of being acted upon in the interest of those for whom they are specially intended.

